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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/830,163	04/21/2004	Maria Tomas Martinez	GEPL.P-088	8109

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EXAMINER
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BOYKIN, TERRESSA M

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/830,163

Applicant(s)

MARTINEZ ET AL.

Examiner

Terressa M. Boykin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 51-60 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-28, 30--50, 61 is/are rejected.
- 7) ☒ Claim(s) 5 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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### ***Response to Arguments***

Applicant's arguments filed 4-12-05 have been fully considered but they are not persuasive.

Applicants' argue that '957 makes not mention of the introducing the dihydroxy compound to a reaction mixture as a melt. However, the oligomeric polycarbonate as prepared according to Silva would infact result in a melted moiety. The use of a batch melt reactor further emphasizes this point.

As noted previously, the use of a continuous or batch reactor is an obvious choice to the skilled artisan and is of no patentable novelty. Silva discloses therein, that the method may be carried out in a batch or continuous mode.

In response to Applicant's argument that the reference(s) **does, do**, not contain the limitations on which the Applicant relies, e. YI, those limitations are either not stated in the claims and/ or are considered inherent. Applicants have not satisfactorily demonstrated how the claims are not anticipated (or rendered obvious) over the reference(s). Applicant(s) are also reminded that patentability cannot be predicated upon an advantage or result that has not been satisfactorily expressly, or least implicitly, disclosed in the application as filed. As noted previously, with regard to the Yellowness Index, the product copolycarbonate samples were clear and had no visible yellowness.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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**Claims 1-4, 6-28, 30—50,61 are rejected under 35 U.S.C. 102(e) as being anticipated by USPub 20030232957 see abstract pages 1-10, figure 1, tables 1-5, 7-13, 14 and claims 1-50.**

In claims 1, 6, 10,11,13 , 25, 30, 50 **USPub 20030232957**

relates to an extrusion method preparing polycarbonates from a solution of an oligomeric polycarbonate. A mixture of bis(methyl salicyl) carbonate (BMSC), BPA and a transesterification catalyst are first equilibrated at moderate temperatures to provide a solution of polycarbonate oligomer in methyl salicylate. The solution is then fed to a devolatilizing extruder, where the polymerization reaction is completed and the methyl salicylate solvent is removed. The solution comprising the oligomeric polycarbonate can also be pre-heated under pressure to a temperature above the boiling point of methyl salicylate and subsequently fed to a devolatilizing extruder equipped for rapid flashing off the solvent. The method provides polycarbonate with greater efficiency than the corresponding process in which unreacted monomers are fed to the extruder. Additionally, the method of the invention does not require the isolation of a precursor polycarbonate comprising ester-substituted phenoxy terminal groups.

The reference, more specifically to applicants' claims, relates to a method for preparing solutions comprising an ester substituted phenol solvent and an oligomeric polycarbonate, and the conversion of said oligomeric polycarbonate into high molecular weight polycarbonate with simultaneous removal said solvent, said method comprising:

Step (I) heating a mixture comprising at least one dihydroxy aromatic compound, an ester substituted diaryl carbonate and a transesterification catalyst at a temperature in a range between about 100 C. and about 300 C. to provide a solution of

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an oligomeric polycarbonate in an ester substituted phenol solvent; and step (II) extruding said solution of oligomeric polycarbonate in said ester substituted phenol at one or more temperatures in a range between about 100 C. and about 400 C., and at one or more screw speeds in a range between about 50 and about 1200 rpm, said extruding being carried out on an extruder comprising at least one vent adapted for solvent removal.

Specifically, the reactants are combined in a vessel in a ratio between about 0.95 and 1.3 moles, preferably between about 1.0 and about 1.05 moles of ester substituted diaryl carbonate per mole of dihydroxy aromatic compound. The amount of transesterification catalyst employed is between about  $1.0 \times 10^{-8}$  and about  $1 \times 10^{-3}$ , preferably between about  $1.0 \times 10^{-6}$  and about  $2.5 \times 10^{-4}$  moles of transesterification catalyst per mole of dihydroxy aromatic compound employed. Upon heating the mixture at one or more temperatures in a range from about 100. C. to about 400. C., preferably from about 100. C. to about 300. C., and still more preferably from about 100 C. to about 250. C., reaction occurs to produce a solution comprising an equilibrium mixture of product oligomeric polycarbonate, by-product ester substituted phenol (solvent), transesterification catalyst, and low levels of the starting materials, dihydroxy aromatic compound and ester substituted diaryl carbonate. This is referred to as "equilibrating" the reactants. Typically the equilibrium strongly favors the formation of product oligomeric polycarbonate and by-product ester substituted phenol and only traces of the starting materials are observed. The "equilibrated" product mixture may then be introduced into a devolatilizing extruder to effect removal of the by-product ester

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substituted phenol solvent while converting the oligomeric polycarbonate into a higher molecular weight product polycarbonate.

With regard to claims 2, 3, 4, 26, 27, 28 the reference states that data for Examples 95-97 are gathered in Table 14 and are consistent with the formation of copolycarbonates comprising both BP and BPA residues. The product copolycarbonate samples were clear and had no visible yellowness. Note tables 1 and 2 and examples 1-5 with regard to residence times. The reaction mixture was stirred and heated until equilibrium was reached. Equilibrium was reached in about 80 minutes at about 165 C. and in about 10 minutes at about 220 C.

With regard to claims 7, 8, 9, 12, 31, 32, 33, 36 note that the reference states that the oligomeric polycarbonate comprises repeat units derived from at least one dihydroxy aromatic compound. Dihydroxy aromatic compounds are illustrated by dihydroxy benzenes, for example hydroquinone (HQ), 2-methylhydroquinone, resorcinol, 5-methylresorcinol and the like; dihydroxy naphthalenes, for example 1,4-dihydroxynaphthalene, 2,6-dihydroxynaphthalene, and the like; and bisphenols, for example bisphenol A and 4,4'-sulfonyldiphenol. The oligomeric polycarbonate typically contains polycarbonate repeat units derived from at least one bisphenol which would imply that one or more may be used.

With regard to claims 20, 21, 44, 45, note that the reference states In Examples 6-11 (Table 2) the ratio of BMSC to BPA employed in the equilibration reaction was 1.017. At equilibrium, the solution of oligomeric polycarbonate prepared from mixtures of BMSC (1.03 moles BMSC per mole BPA), BPA and TBPA ( $2.5 \times 10^{-4}$  moles per mole

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BPA) was about 45 percent by weight polycarbonate oligomer and about 54 to about 55 percent by weight methyl salicylate.

With regard to claims 14, 15, 38, 39, note that the reference is concerned about the degradation of diaryl carbonate and seeks to remove impurities which may contribute thereto. For example the reference states:

"Lastly, the tendency of polycarbonates to degrade at high temperature, for example during molding, with concomitant loss of molecular weight and discoloration correlates strongly with the presence of contaminating species within the polycarbonate. In general, the level of purity of a product polycarbonate prepared using a melt reaction method such as the instant invention will closely mirror the level of purity of the starting monomers."

With regard to claims 35, 37, 30 note that the reference states Solutions of oligomeric polycarbonate in methyl salicylate were prepared by equilibrating a mixture of bis(methyl salicyl) carbonate (BMSC), bisphenol A (BPA) and transesterification catalyst, tetrabutylphosphonium acetate (TBPA), at a temperature in a range between about 160.degree. C. and about 220.degree. C. in a batch melt reactor *under a nitrogen atmosphere* which would necessarily exclude the presence of substantial oxygen in the atmosphere.

With regard to claims 16, and 40 note that the reference discloses in one embodiment of the invention reactants, ester substituted diaryl carbonate, dihydroxy aromatic compound and a transesterification catalyst are combined in a reaction vessel 10 and heated at a temperature in a range between about 100.degree. C. and about 300 C., preferably between about 150 C. and about 250 C., at a pressure between about 1 atmosphere and about 10 atmospheres, preferably between about 1 and about 2 atmospheres, to provide a solution of an oligomeric polycarbonate in an ester substituted phenol.

With regard to claims 17, 19, 41, 43 note that the reference discloses that the recovered ester substituted phenol may be purified by distillation or other means and recycled to prepare additional ester substituted diaryl carbonate.

With regard to claims 18, 42 note Tables 7-13 in the reference.

With regard to claims 22, 23, 24, 47, 48 and 49 note Table 1.

With regard to claim 46 note that the reference states that the solid is filtered off and the resulting filtrate is analyzed by high performance liquid chromatography (HPLC) using p-terphenyl as the internal standard.

Thus, the reference discloses a method of preparing a polycarbonate oligomer mixture prepared from the same components as claimed by applicants. Thus in view of the above, there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any



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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### **Objected Claims**

Claims 5 and 29 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### **Correspondence**

Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is ( 571-272-1700).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb



Examiner Terressa Boykin

Primary Examiner  
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